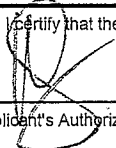


## APPLICATION FORM

State of California - The Strategic Growth Council  
URBAN GREENING PROJECTS GRANT PROGRAM

<b>APPLICANT (Agency and Address - including zip code)</b> The Watershed Project 1327 S 46th Street Building 155 Richmond California 94804 Applying for targeted Disadvantaged Community funds		Grant Amount Requested: \$ 74,940.00 Estimated Date of Completion: 1/31/2012 Estimated Total Project Cost: \$ <b>135,710.00</b> (including State grants, other funds and in-kind donations)	
Check one: Non-Profit <input checked="" type="radio"/> City <input type="radio"/> County <input type="radio"/>		County <b>Contra Costa</b> Nearest City to Project <b>Richmond</b>	
<b>Project Name</b> Richmond Greenway Native Plant Garden Bioswale		Project Address <b>Richmond Greenway between 8th &amp; 8th Streets</b> Richmond California 94804 Nearest Cross Street <b>Ohio</b>	
		Senate District No. 9	Assembly District No. 14
<b>Applicant's Representative Authorized in Resolution</b>			
Name: <b>Harold Hedelman</b>		Title: <b>Development Director</b>	
Phone: <b>(510) 665-3549</b>		Email Address: <b>harold@thewatershedproject.org</b>	
<b>Person with Day to Day Responsibility for Project (if different from Authorized Representative)</b>			
Name: <b>Juliana Gonzalez</b>		Title: <b>Community Programs Mgr</b>	
Phone: <b>(510) 665-3597</b>		Email Address: <b>juliana@thewatershedproject.org</b>	
<b>Brief Description of Project</b> (Summarize major activities to be funded by this Grant) Community-based effort to develop two blocks of the Richmond Greenway into a native plant garden bioswale		Latitude 37.93137	Longitude -122.362815
		Coordinates Represent: <u>Rough center of area</u> Coordinates Determined Using: <u>Other</u> (See next page for instructions and choices)	
<b>STATUTORY REQUIREMENTS - Check all that apply to your project</b>		<b>Project Data: Please enter the quantity (to nearest 0.1 unit) on all the following measures that apply to your project</b>	
<input checked="" type="checkbox"/> Uses Natural Systems or Systems that Mimic Natural Systems			
		Acres of Habitat to be <u>Acquired</u>	
<input checked="" type="checkbox"/> Creates, Enhances or Expands Community Green Spaces		Acres of Green/Open Space to be <u>Acquired</u>	
Provides the Following Multiple Benefits		0.34 Acres Green Space to be Restored/Enhanced/Managed	
<input checked="" type="checkbox"/> Decreases Air and Water Pollution		0.34 Acres of Habitat to be Created/Enhanced/Restored	
<input checked="" type="checkbox"/> Reduces the Consumption of Natural Resources and Energy		0.34 Acres of Invasive Species to be Eradicated/Treated	
<input type="checkbox"/> Increases the Reliability of Local Water Supplies		Acres of Wetland to be Created/Preserved	
<input checked="" type="checkbox"/> Increases Adaptability to Climate Change		0.83 Acre Feet of Stormwater to be Captured	
List Other Multiple Benefits not identified above: <small>Increased access to open space, Safe route to schools, non-motorized transportation alternative, Serve high density population, increase access to healthy food, provide educational resource, provide wildlife habitat, improve physical &amp; mental health</small>		0.34 Acres of Park and/or Community Garden to be Created or Enhanced	
		0.12 Miles of Recreation Trail to be Created/Enhanced	
<b>URBAN GREENING PRIORITIES</b>		13.82 Metric Watt Hours (MWH) Usage to be Reduced	
<input checked="" type="checkbox"/> Uses Interagency Cooperation and Integration		62.0 Trees to be planted	
<input checked="" type="checkbox"/> Uses Existing Public Lands and Facilitates Use of Public Resources and Investments, including Schools		Milligrams per Liter (Mg/L) of Pollutant Reduced	
<input checked="" type="checkbox"/> Is Proposed by an Economically Disadvantaged Community		0.02 Other: Mercury	
<input checked="" type="checkbox"/> Improves Public Health		0.02 Other: lead	
<input checked="" type="checkbox"/> Is Innovative or Unique		0.05 Other: arsenic	
<input checked="" type="checkbox"/> Is Proposed by a Community Vulnerable to Climate Change			
I certify that the information contained in this project application, including required attachments, is complete and accurate.			
Signature: 		Date: <b>4/29/10</b>	
Applicant's Authorized Representative as shown in Resolution			
Print Name and Title:			

# ONE PAGE SUMMARY — RICHMOND GREENWAY NATIVE PLANT GARDEN BIOSWALE

## PROJECT SUMMARY STATEMENT

The purposes of the *Richmond Greenway Native Plant Garden Bioswale* are to transform a section of the Richmond Greenway from vacant lot and bike path into a vibrant native plant garden that (1) connects people to nature, (2) reduces stormwater pollution, (3) encourages wildlife in a natural habitat, (4) enhances urban agriculture, (5) educates K-12 students and the general public, (6) encourages increased use of the Greenway as a motorized transportation alternative, (7) improves mental health and provides healthy exercise and recreation options to an underserved, high-density, community (8) serves as a demonstration of low-impact design infill best management practices (9) pilots a technique that could be extended to numerous sites along the full 3 miles of the Greenway. The project is highly accessible to the public. It is open 24x7, there are no barriers. As part of the Greenway, it is connected to BART, Amtrak, AC Transit, the Bay Trail, and the Ohlone Greenway.

The objectives are (1) a swale design that meets City design requirements, (2) build a swale that re-engineers a two block long section of poorly infiltrating drainage ditch (3) improve infiltration of stormwater pollutants. (4) Engage the community in implementation (

## PROJECT COST SUMMARY

Categories	Requested Grant Funds	Other Funding Sources	Total Cost
Project management	6800	4000	10800
Creating the Native Plant Bioswale Garden	18280	10060	28340
Materials	19580	13840	33420
Volunteer & Other	3700	18030	21730
Contingency	7000	0	7000
Total	74940	60770	135710

## PROJECT QUESTIONS: THE RICHMOND GREENWAY NATIVE PLANT GARDEN BIOSWALE

### STATUTORY REQUIREMENTS

#### PROJECT DESCRIPTION AND HOW IT USES OR MIMICS NATURAL SYSTEMS

The 3-mile long Richmond Greenway cuts across the Sante Fe Watershed in the City of Richmond, California. The Greenway is a downslope border of the infamous Iron Triangle neighborhood, which got its name because the community was created by three railroad lines that intersect to form a triangle. The Greenway itself is a converted railroad right-of-way, and its heavily compacted and often polluted soils are a legacy of that land use. A bike path runs right down the middle of the Greenway.

The *Richmond Greenway Native Plant Garden Bioswale* site occupies a 2 block long stretch on the south side of the bike path, between 6<sup>th</sup> and 8<sup>th</sup> streets. Although the City of Richmond is **not required** to reduce stormwater pollution at this site, this proposal will reduce stormwater flows and pollution at the site, which currently consists of a drainage ditch surrounded by an upland area that slopes gently into the swale. Currently, the soil is compacted, relatively impervious, and little infiltration occurs. The watershed's stormwaters drain across the Greenway towards the San Francisco Bay. Floodwaters from the surrounding Iron Triangle community enter our site's ditch at one end (and the middle) of the two-block section and exit the ditch at the other end.

The project **both uses and mimics** natural systems. It uses the infiltrative efficacy of native plants, installs them in a way that mimics their placement in a natural creek, and engineers soil strata within the swale to create an efficient layering of soil ingredients that mimic the water infiltrating capacity of natural creek hydrology.

The swale's design will improve infiltration by introducing porous soil and gravel and by planting native plants in, along, and around the re-engineered ditch. The techniques for reconstructing the soil structure will result in a system that mimics a pre-industrial soil structure, one that minimizes runoff. The native plants added to the site are a natural infiltration system. The design will comply with Contra Costa County standards for bioswales, which are quite forward-thinking and well-aligned with swale best management practices.

A native plant garden has been started in the upland corner at the west-most portion of the site.

#### HOW WAS THE PROJECT SITE SELECTED AND/OR PRIORITIZED?

In a recent study for the City of Richmond, the Sante Fe Watershed was identified as one of three highest priority watersheds for reducing stormwater pollution within the city. Within the watershed, the Greenway site was selected because it (1) offers ease of public access (2) addresses environmental justice issues (3) is ideal for involving the community in design and implementation (4) provides a K-12 educational resource— it is very close to 3 local schools (5) developing the Greenway is part of the City's long range plan.

#### MULTIPLE BENEFITS

The Richmond Greenway Native Plant Garden Bioswale offers the following benefits:

<input checked="" type="checkbox"/>	Decrease in air and water pollution
<input checked="" type="checkbox"/>	Reduction in the consumption of natural resources and energy
<input checked="" type="checkbox"/>	Increased adaptability to climate change
<input checked="" type="checkbox"/>	Other: Increased access to open space
<input checked="" type="checkbox"/>	Other: Safe route to schools

x	Other: Alternate mode of transportation
x	Other: Serving an area of high density population
x	Other: Helping provide access to healthy food
x	Other: Providing an environmental educational resource
x	Other: Wildlife corridor
x	Other: Health benefits— encouraging physical exercise

### ***Decrease in air and water pollution***

**How will the project decrease air pollution?** The *Richmond Greenway Native Plant Garden Bioswale* will reduce air pollution and greenhouse gas emission by encouraging use of the Greenway as a non-motorized transportation alternative. The Greenway connects to multiple transit hubs, including Bay Area Rapid Transit (BART) AC Transit, and AMTRAK. It also connects the Ohlone Greenway with the San Francisco Bay Trail.

What approach was used to determine said reductions?

**How will the project decrease water pollution?** The *Richmond Greenway Native Plant Garden Bioswale* will reduce water pollution by infiltration of pollutants out of stormwater and into the ground. Two main techniques will be used:

- The current drainage ditch will be re-engineered by (1) removing compacted soil (2) inserting a perforated drainage pipe covered with permeable root-block fabric, then, gravel and, finally, porous soil. Stormwater that makes it into the pipe will infiltrate into the ground via the pipe's perforations.
- Infiltration is in large part a process of slowing the movement of water across a surface, giving it a chance to move downward into the soil. Native plants in, along, and around the swale will slow the flow of water into the swale, giving it a chance to infiltrate. Over time, as the plantings mature, the plants will accomplish their task in three increasingly efficacious ways. (1) As their root structures mature, the plantings roots more completely perforate the soil, increasing its ability to capture water. (2) As the plantings grow in size (both horizontally and vertically) the above ground vegetation will more effectively dampen the impact of rain on the soil surface. (3) Finally, a growing mulch layer will itself absorb water, trap pollutants, and improve soil structure to increase infiltration.
- The project will also reduce use of chemical fertilizers and pesticides. It will accomplish this by educating the public (via the demonstrative nature of the bioswale garden and its interpretive signage) that fewer pesticides are needed when native plants are used, both because natives themselves do well without chemicals and because they encourage beneficial insects that reduce the need for pesticides.
- The project will also reduce the use of pesticides to kill mosquitoes. Spraying happens when standing water that doesn't infiltrate sits in the existing drainage ditch. By improving infiltration, standing water will not be a problem.

What approach was used to determine said reductions? FOR ALL These approach ?s, answer "How do we know this will be accomplished?"

### ***Reduction in the consumption of natural resources and energy***

How will the project reduce the consumption of natural resources?

The native plantings of the *Richmond Greenway Native Plant Garden Bioswale* will conserve soil by reducing erosion. The plants' above ground vegetation and the mulch they create will shield the soil from erosive rain. As the mulch layer ages and merges with the current soil surface, it will help water percolate into lower levels of the

soil rather than become runoff, carrying soil with it. The plants' root structures will also help hold soil in place.

It is a well established principle that soil erosion is limited when overland flow is reduced (1) as in the case of a bioswale and (2) when the kinetic energy of the rain is reduced by increased vegetation cover.

**How will the project reduce the consumption of energy?** The project will reduce energy consumption by reducing pumping costs. Currently, floodwaters in the Santa Fe Watershed are managed by a system of detention ponds and pumps. By demonstrating the efficacy of biological techniques to increase infiltration, the *Richmond Greenway Native Plant Garden Bioswale* encourages adoption of these best practices in other locations throughout the watershed, which will reduce the need for pumping (and therefore, energy consumption.)

Trees in the project will reduce energy consumption. See the table in the section on Reducing GHG emissions.

What approach was used to determine said reductions? Water pumping is necessary in the Santa Fe Watershed due to the fact that the natural watershed hydrology has been heavily impacted by urbanization and the construction of railroads. The increased percolation of water due to large plants and trees will help recharge the aquifer and reduce urban runoff reaching the pumps. Lower volumes of water reaching the pumps requires less use of energy.

**How will the project reduce the consumption of water?** The project will reduce water consumption. Of all the possible ways to create a green Greenway, installing native plants with a temporary hydro-zoned drip system is the most water-conservative. One of the beauties of appropriately chosen drought-tolerant native plants is that once the plantings are established (1-4 years), little or no water at all will be required. The use of drip irrigation and hydro-zoning minimizes water usage during their establishment. Subsequently, summer water is not needed. All of this is part of our project's design plan.

What approach was used to determine said reductions? The drought tolerant plants that will be planted in the uplands have been selected based on the regionally-authorized Bay Friendly Gardening planting list for scrub and grasslands ecosystems.

***Increase in the reliability of local water supplies*** N/A

***Increased adaptability to climate change***

How will the project increase adaptability to climate change?

The native plantings in the *Richmond Greenway Native Plant Garden Bioswale* will increase the amount of respiring vegetation over what is presently on site. Their respiration will remove CO<sub>2</sub> from the atmosphere. The increased vegetative cover will cool— via shading— the surface of the ground, directly off-setting warming. The trees that are part of the site design will be especially helpful in these regards.

What approach was used to determine said benefits? Some California climate change models predict an increase in "an increase in the frequency of heavy (greater than 25mm/day) precipitation events." These could lead to an increase in stormwater-caused flooding. The bioswale— and the use of swales it will encourage throughout the watershed— will help adapt to such increased floodwaters.

***Other Benefits***

**INCREASED ACCESS TO OPEN SPACE**

Currently, most of the Greenway looks like one huge vacant lot with a bike path running through it. By helping developing the Greenway into something truly green, this project will encourage increased use of the Greenway. Increased usage will in turn stimulate more community stewardship of the Greenway, which will encourage more usage: A wonderful positive feedback cycle we look forward to catalyzing.

**SAFE ROUTE TO SCHOOLS**

A recent pedestrian safety report named Richmond as the 7<sup>th</sup> most dangerous city in California for pedestrians<sup>ii</sup>. Bicycle conditions are also substandard; data from the Contra Costa Transportation Authority indicates that Richmond has a disproportionately high number of the total bicycle fatalities and injuries in the County.

The *Richmond Greenway Native Plant Garden Bioswale* is kitty corner to Lincoln Elementary one block from Leadership Public High School Richmond (a charter) and just four blocks from Nystrom Elementary School. Completing this project will encourage students to use the Greenway to travel to and from school, a far safer route than city streets.

#### ALTERNATE MODE OF TRANSPORTATION

Alternative transportation reduces pollution and traffic, keeps people fit, and creates a healthier community. Richmond residents have proportionally fewer cars than other Bay Area cities—making it of the utmost importance to provide safe biking and walking facilities that connect seamlessly to local and regional mass transit. A full 29% of Richmond residents don't own cars<sup>iii</sup>. A green Greenway will encourage residents without cars to use the Greenway as an avenue for safe, healthy transportation, and encourage residents with cars to get out of their cars for short trips.

#### SERVING AN AREA OF HIGH DENSITY POPULATION

Richmond's dense population (over 1660 people per square mile) makes it even more conducive to walking and bicycling. As measured by the City of Richmond's Planning Department (map and email attached) there are 13.88 dwelling units per acre.

#### HELPING PROVIDE ACCESS TO HEALTHY FOOD

The *Richmond Greenway Native Plant Garden Bioswale* will attract and provide habitat for beneficial insects and native pollinators. The presence of these will benefit adjacent Greenway fruit, vegetable and berry gardens (operated by Urban Tilth and Lincoln Elementary School) by improving pollination and reducing pest populations.

#### PROVIDING AN ENVIRONMENTAL EDUCATION RESOURCE

This project will be used as a semi-formal outdoor classroom by K-12 students, and an informal outdoor classroom by the general public. It will provide a place for education about nature and the environment in an urban setting. The project is designed to function as an educational resource in the following ways

- Interpretive signage will explain the function and benefits of the native plantings and the bioswale
- The Watershed Project will bring middle and high school students to the site to perform service learning which is a requirement for graduation in Contra Costa County.
- The Watershed Project will provide on-going outreach to recruit community volunteers for maintenance workdays. These events will inform the public (along with the signage) about the site's ecology and benefits.

#### WILDLIFE CORRIDOR

The native plantings will contribute to an on-going process of urban greening in West Contra Costa that focuses on creek and shoreline habitats. Seen in aggregate, these efforts are providing increasing amounts of essential habitat for urban wildlife, and increasing opportunities for residents to observe and appreciate Nature. As the Greenway is developed, it will become an important wildlife corridor and the current project is an important milestone in this regard.

#### HEALTH BENEFITS— ENCOURAGING PHYSICAL EXERCISE

Block-by-block, as the Greenway is developed, community members will find increasing reasons to use it, and that means walking, running, or bicycling. By helping complete the Greenway, the *Richmond Greenway Native Plant Garden Bioswale* will promote physical exercise in the community.

## CONSISTENCY WITH THE STATE'S PLANNING POLICIES

### ***Promote infill development and invest in existing communities***

The *Richmond Greenway Native Plant Garden Bioswale* is an investment in a densely urban community. One of the returns on that investment is a bioswale that will be used by the city as a demonstration project of the correct way to construct a bioswale that will allow local infill development to meet stormwater requirements in a cost-effective, environmentally friendly way.

### ***Protect, preserve and enhance environmental, agricultural and recreation resources***

This project will enhance the Richmond Greenway as an environmental, agricultural and recreation resource. Environmentally, it increases biodiversity by adding native plants and providing wildlife habitat. Agriculturally, it enhances the adjacent fruit and vegetable gardens, which are part of Richmond's growing urban agriculture movement. It does that via the habitat it offers for beneficial insects and pollinators. By enhancement, the project encourages use of the Greenway for recreation, transportation, and education.

## DESCRIBE HOW THE PROJECT IS CONSISTENT WITH ANY APPLICABLE REGIONAL PLAN

The City of Richmond Parks and Landscaping Plan<sup>iv</sup> (a 64-page element of the City's general plan) states that

*"... The Richmond Greenway ... will provide a much needed east-west connection through the City, tying together the Bay Trail ... and the Ohlone Greenway that runs north-south along the eastside of the City."*

*"... lack of connectivity due to railroads, highways and poor transportation options keeps residents in the central core of the City from utilizing the open space lands around the City ... Richmond's core neighborhoods would benefit from safer, close-to-home resources."*

Contra Costa County's "STORMWATER C.3 GUIDEBOOK - Stormwater Quality Requirements for Development Applications" specifies how to meet the Regional Water Quality Board's C.3 requirements. The *Richmond Greenway Native Plant Garden Bioswale* is designed to meet those standards.

## HELPING MEET CALIFORNIA'S GREENHOUSE GAS (GHG) EMISSION REDUCTION

By making the Greenway more beautiful, interesting, and educational, the *Richmond Greenway Native Plant Garden Bioswale* will encourage use of the Greenway as a non-motorized "active transportation" alternative. Active transportation reduces pollution and traffic; a green Greenway will encourage residents without cars to use the Greenway as an avenue for safe, healthy transportation, and will encourage residents with cars to get out of their cars for short trips. A reduction in GHG emissions will occur every time the Greenway is used as an alternative to motorized transportation. Further GHG emission reductions will occur because the Greenway connects to three major public transportation systems: Bay Area Rapid Transit, Amtrak, and AC Transit. People who travel the Greenway to use these public transit options will be further reducing GHG emissions (compared to driving to their destination.) Finally, this projects results in reductions due to tree planting. The following table shows relevant reductions for the 4 tree species in this project. Note: the table only indicates values for 1 tree of each species.

GHG Reductions per Tree Species (figures are for 1 tree)		Energy reductions		Emission reductions (CO <sub>2</sub> equiv)		CO <sub>2</sub> Sequestration	Total CO <sub>2</sub> Stored
		Cooling	Heating	Cooling	Heating		
	Tree height	kWh/tree	Mbtu/tree	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)

<i>Sequoia sempervirens</i>	65.6 feet	192.27	0.23	76.1	11.7	130.6	1178.9
<i>Quercus agrifolia</i>	37.0 feet	309.4	0.39	122.4	20.6	214.4	3114.5
<i>Alnus rhombifolia</i>	28.7	309.9	.4	270.2	44.3	230.8	5007.7
<i>Salix ssp. (estim)</i>	20.0 feet	150.5	0.17	131.2	19.2	268.5	3789.4

## HOW DID YOU DETERMINE THE IMPACTS OF YOUR PROJECT ON GHG EMISSIONS?

See the California Air Resources Board Regional Targets Advisory Committee's final report: "Recommendations of the Regional Targets Advisory Committee Pursuant to Senate Bill 375 — A Report to the California Air Resources Board" Also, see "Active Transportation for America— The Case for Increased Federal Investment in Bicycling and Walking<sup>vi</sup>".

We used the USDA Forest Service Pacific Southwest Research Station Center for Urban Forest Research's Tree Carbon Calculator for Live Oaks and Redwood. The software is a 'beta' and didn't include any *Alnus* or *Salix* species. We substituted *Prunus cerasifera* for *Salix* (and reduced the figures by 60% as a way of providing an estimate) and *Acer palmatum* for *Alnus*.

## AVAILABLE GREEN SPACE / VEGETATION / TREE ASSESSMENTS

We were unable to locate an assessment relevant to this community.

## PRIORITY CONSIDERATION: SGC URBAN GREENING PRIORITIES AND OBJECTIVES

## INTERAGENCY COOPERATION AND INTEGRATION/COLLABORATION

### *Partnerships with other entities, and their corresponding roles*

The relevant partnerships are described in the following table

<i>Entity</i>	<i>Role</i>
Bayer Pharmaceutical	Engineering input to project design and curriculum. Corporate volunteers for workdays
City of Richmond Parks & Landscaping	Provide ( <u>pro bono</u> ): <ul style="list-style-type: none"> <li>• Rocks and boulders for the bioswale hardscapes</li> <li>• Locally recycled mulch</li> <li>• Truck, equipment and driver for moving earth and installing the mulch and</li> </ul>
City of Richmond Stormwater Program	Advice and consultation
Curtis & Thompson Water Testing Company	<u>pro bono</u> water quality testing
Earth Team	Provide service learning students to work on the site
Friends of the Richmond Greenway	Collaborate on project design and implementation. Help with outreach for community volunteers
Making Waves	Provide service learning students to work on the site
Rails to Trails Conservancy	Provide outreach to the community and engage volunteers in the process of completing the project
Resources Design Group	Provide <u>pro bono</u> landscape architecture advice & consultation



### ***Steps to faster interagency relationships and blend jurisdictional responsibilities***

From its inception, the Greenway has been a community-driven collaboration between the City of Richmond and the community, including a variety of non-profits. The *Richmond Greenway Native Plant Garden Bioswale* project was born out of this co-creative context and started as an "Adopt-a-Park" agreement between the City's Division of Parks & Landscaping and The Watershed Project. Collaboration with the City's Stormwater Pollution Program Manager has informed project design. Because the project affects both Stormwater and Parks & Landscaping, these two divisions have interacted to coordinate roles and responsibilities.

### ***Community involvement and support***

Friends of the Richmond Greenway (FORG) is the community group whose sole mission is developing the Greenway. TWP and FORG meet regularly to keep the community engaged, informed, and to recruit volunteers. Making Waves and Earth Team are involved in K-12 Education, and TWP interacts with these groups to engage students in educational stewardship activities on the Greenway. Bayer Healthcare is providing engineering support. Curtis and Thompson is providing pro bono water testing. Restoration Design Group is providing landscape design services.

### ***How will the project increase community interaction and cooperation?***

The project plan incorporates two elements of interactive and cooperative community involvement:

- Outreach events where the plan is presented and discussed. Community feedback is elicited and incorporated into the implementation process.
- Community volunteers are recruited for workdays. These events provide essential people power for building the project and are an integral part of the implementation plan.

## **USE OF EXISTING PUBLIC LANDS / FACILITATING USE OF PUBLIC RESOURCES AND INVESTMENTS**

***Is this project an acquisition? NO***

### ***Other resources for this project?***

San Francisco Estuary Project	\$13,800
US EPA Environmental Justice Small Grant Program	\$25,000
Clif Bar Family Foundation	\$10,000
Patagonia	\$2,000
East Bay Municipal Utilities District	in-kind
City of Richmond	in-kind

## **PROJECT IS PROPOSED BY AN ECONOMICALLY DISADVANTAGED COMMUNITY**

### ***Project location relative to the economically disadvantaged community***

The *Richmond Greenway Native Plant Garden Bioswale* is wholly surrounded by a severely economically disadvantaged community. The attached Community Fact Finder report calculates the MHI as \$34,884, with 2,823 people living below the poverty level.

### ***How the project will expand acreage and/or access to green space***

The Greenway— as it is today— is basically a 3-mile long vacant lot dissected by an asphalt bike path and containing exactly two small islands of green. The *Richmond Greenway Native Plant Garden Bioswale* is the next step of the ongoing effort to "Green the Greenway." Two more green blocks, two more milestones towards the ultimate vision, and two more reasons for the community to use the Greenway. Although the project does not

increase the bare acreage, it increases green acreage and creates access by encouragement and enhancement.

Our vision is the project is a pilot for what the 3-mile Greenway backbone will become: a native plant bioswale garden which will provide significant environmental services and support other key features and amenities such as play structures, outdoor exercise equipment, and urban agriculture sites, all tied together by the Greenway.

### ***Continued community involvement***

The community has been involved in creating the Greenway for well over a decade. With the bike path in place, the community's current efforts are focused on plantings, parks, and connectors to other trails. The Watershed Project is working with all the stakeholders — governmental as well as NGO's— on this new phase of the Greenway. We meet with our partners to engage volunteers, to plan events, to clarify roles and responsibilities, and to celebrate accomplishments.

### **URBAN GREENING ADDITIONAL PRIORITIES, PUBLIC ACCESS, PROGRAM OBJECTIVES**

#### **IMPROVES PUBLIC/COMMUNITY HEALTH**

*Indicate which of the following apply to the project and explain how the benefits will be achieved*

Improved mental health and overall well being (from volunteering, exercising, active transportation, and spending time in nature)	<p>This project offers many volunteer opportunities for community members. Doing volunteer work is good mental health for several reasons<sup>vii</sup>. Studies of volunteers report higher levels of life satisfaction as a result of social participation. Also, providing help as a volunteer is a self-validating experience and it fosters a belief in being able to make a difference. This project engages both students and community volunteers in workdays on the site. Large scale volunteer events are held on Earth Day and Martin Luther King Day of Service. Small scale events are on-going, and include service learning classes. These events are also good for mental health because they promote social networking.</p> <p>People who use the Greenway for exercise or transportation will also improve their mental health<sup>viii</sup>. Researchers at Duke University demonstrated several years ago that exercise has antidepressant properties. Other research has shown that exercise can improve the brain functioning of the elderly and may even protect against dementia.</p> <p>A nature-rich Greenway will be good for the mental health of children who use it, especially those who would otherwise spend their time indoors<sup>ix</sup>.</p>
Increased physical activity	<p>The Greenway will be used by people for transportation and exercise purposes, and these users will experience the health benefits of exercise.</p> <p>Volunteers who work on this project will also experience this benefit.</p>
less pollen / allergens	N/A
Risk of skin cancers	N/A
Access to locally grown/sustainable food sources	This project will enhance the productivity and quality of adjacent fruit and vegetable gardens by providing habitat for beneficial insects and pollinators, thereby enhancing access.
Access to nature	This project will transform a vacant lot into natural habitat.
safe active	This project encourages use of the Greenway as a safe active transport

transportation	corridor
hiring/training local disadvantaged youth	The project site is used by our Green Academy (Clean and Green) program which hires & provides "green" job training to local disadvantaged youth
serves an area of high density population	This project is located within an area of high density population, over 13 dwelling units per acre.
Reduce stormwater pollution	The bioswale is designed to reduce stormwater pollution
Education about pollution	The project will provide education to community members and students about native plants, stormwater pollution and biological techniques for reducing stormwater pollution

***Strategies to ensure the disadvantaged community will realize these health benefits***

Publicity and other outreach efforts will encourage community members to use the Greenway, attend meetings, and volunteer. Many of these efforts focus around high profile holidays: MLK and Earth Day Outreach efforts will engage community members in volunteering

Greening the Greenway will encourage usage for transportation, recreation, exercise, and encountering Nature. Completing the native planting will provide the beneficial insects and pollinators. This will improve the quality of produce from adjacent urban agriculture efforts, and the improved quality will increase usage.

Separate fundraising efforts to fund our Green Academy (Clean and Green) Program will allow us to hire local disadvantaged youth

The project plan includes installation of interpretive signage that provides educational benefits. Additional signage ("Burn Calories not Carbon") will encourage the exercise and active transportation benefits.

**INNOVATIVE AND/OR CREATIVE**

***How the project is innovative and creative***

This project integrates several key elements. It is the integration of these that is unique and innovative

- A native plant garden
- A stormwater best management practice
- Greenway enhancement
- An outdoor classroom
- Urban agriculture
- Community-based implementation

***Discuss how this project required an approach that is "out of the box" (paradigm shift).***

We had to get the City's divisions of Parks & Landscaping and Stormwater Pollution Program to collaborate.

***This project as a model. Explain the unique community conditions that make this project a good fit***

The City of Richmond will use the bioswale to demonstrate to developers working on infill projects how to incorporate low-cost, effective, biological techniques to meet stormwater handling requirements. Because it's in an open space, the location is quite accessible for this purpose. All around the Bay, new NPDES are requiring local entities to clean up stormwater, and this project is a good demonstration of a best practice.

This project is also a pilot for replication elsewhere along the Greenway. The Greenway cuts across the Sante Fe Watershed flow to the Bay. A swale running the length of the Greenway would make a significant contribution to

keeping urban runoff from reaching the Bay. Our intention is that what we learn by implementing the bioswale garden will advise that larger project and provide momentum for that effort.

In terms of unique conditions, the following demographics are a good start. In the 2000 census, Richmond, CA. had 99,000 people. Per capita income is \$19,788. Racial composition is African American: 36%; White: 31%; Asian: 12%; Some other race: 16%; Two or more races: 5%. Of these, 26.53% report as being Latino or Hispanic. In 2007, Richmond reported the highest per capita murder rate in the state for cities with at least 100,000 people. Richmond has more S.F. Bay Shoreline than any other Bay city, but massive industrial pollution has created a very low-income community with under-funded schools and few environmental learning opportunities for youth. That industrial legacy has created many environmental justice issues, including multiple Superfund sites, and the infamous Iron Triangle.

The Richmond Greenway is one border of Richmond's Iron Triangle neighborhood, which got its name from three major railroad lines which form a rough triangle and define its boundaries. The northeastern tracks belong to Union Pacific. Burlington Northern tracks form the northwest border, and southern side of the triangle is formed by the now abandoned Santa Fe tracks, currently being developed as the Richmond Greenway. With a geography created by Iron Horses, this neighborhood came to be called "The Iron Triangle." People inside the interior of the Triangle were for generations isolated, literally trapped inside by the rusty, dusty, polluted railroad rights of way.

The Iron Triangle has a population of 19,807 and is the heart of Richmond's African-American community (it is 66% African-American). It is also a high crime area. In 2008, federal, state and local authorities arrested 18 people during a gang raid on the Deep-C or "Deep Central" gang, responsible in 2007 for more than half of Richmond's 47 homicides -- the highest per-capita murder rate in California. "This was a tremendous effort involving several agencies to take down the viciousness and power of this gang," Attorney General Jerry Brown remarked. "These guys had been ... terrorizing this community ... and it had to stop."

Cut off from the rest of the city and any 'Nature areas', the community is in desperate need for more open space, and opportunities to experience nature and learn about the environment. These unique conditions make this project a unique fit for the community.

#### *Unique design parameters, performance measures, or potential outcomes*

One unique outcome will be a study of other potential sites within the Sante Fe Watershed. The study will recommend specific sites for replication.

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### COMMUNITIES MORE VULNERABLE TO CLIMATE CHANGE

#### *Is the project proposed in an area that is especially vulnerable to climate change?*

According to the Pacific Institute<sup>x</sup> the southwest portion of the Iron Triangle (and adjacent sections of Richmond) will be inundated during peak storm events due to climate change which will cause sea levels to rise.

#### *Effects of climate change. Wildlife sensitivities*

Richmond has more shoreline (~ 32 miles) than any other city in the Bay Area. With an expected 55" of sea level rise by 2100<sup>xi</sup>, much will be at risk. 14 EPA-regulated sites— including 2 SuperFund sites— are within the expected 100 year flood zone. **Residential neighborhoods (including part of the Iron Triangle) are also in the flood zone.**

Climate change will also result in higher peak water volume storm events and stormwater runoff will carry increased toxic loads into the San Francisco Bay. If the peak volumes overwhelm the carrying capacity of the existing flood control system, toxics could flood the surrounding Richmond neighborhoods, spreading pollutants throughout the SW corner of the Iron Triangle. A mere two miles west (into the coastal flood zone) of the Iron Triangle flood zone, is Pt. Molate, home to one of the very few remaining native California grassland prairies.

Richmond is in Contra Costa County. Within the county, the Pacific Institute projects the following impacts:

- 37 miles of railroad track (second highest in the state) are threatened by a flood event and many of those miles are in Richmond
- 100 miles of highway (10<sup>th</sup> in the state)
- 4 power plants are vulnerable
- 5,800 people are at risk
- Two sewage treatment plants are vulnerable
- \$.98 billion is the estimated replacement value of buildings and contents impacted by flooding.

### *Elements that directly respond to the negative impacts of climate change*

The swale will capture pollutants carried in floodwaters and keep them from reaching the Bay. The native plantings will sequester carbon and consume CO<sub>2</sub>.

### *Impacts of climate change on the project*

Plants and trees chosen are both flood and drought tolerant. This site is not predicted to experience sea-water flooding under any of the climate change models (although more westerly parts of the Greenway are.)

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## THIS PROJECT ADDRESSES ENVIRONMENTAL JUSTICE ISSUES

### *Canopy coverage*

The Iron Triangle has far less canopy coverage than surrounding communities such as El Cerrito, Albany, and Berkeley, which have many densely tree-lined streets. The Iron Triangle has virtually none.

### *Air and/or water pollution*

Richmond is disproportionately impacted by environmental harms and risks, including more air and/or water pollution than surrounding communities. It is dense with hazardous material and waste sites, negatively impacting the health and well-being of residents, workers, and many natural resources in the area, including the San Francisco Bay<sup>xii</sup>. Current industrial operations have ongoing major detrimental impacts. Richmond Mayor Gayle McLaughlin says "Richmond has suffered, especially in neighborhoods near the refinery," referring to high rates of asthma, cancer and heart disease in neighborhoods affected by pollution from Chevron's Richmond refinery<sup>xiii</sup>.)

### RICHMOND AIR QUALITY

Richmond suffers disproportionately high levels of air pollution in all 6 categories of<sup>xiv</sup> the Bay Area Air Quality Management Dist. Emissions Summary (base year 2005<sup>xv</sup>.) The California Air Resources Board 2009 tally of GHG emitters shows 5 refineries in (or within 14 miles of) Richmond at the top of the list. The **largest emitter** in ALL of California last year was **Chevron's Richmond refinery**. Other nearby refineries were 2<sup>nd</sup>, 7<sup>th</sup>, 8<sup>th</sup>, and 15<sup>th</sup>. They released 184,441 tons (9.1%) of the TOTAL facilities emissions of CO<sub>2</sub> for the entire State<sup>xvi</sup>. They also emit other toxics, such as sulfur dioxide (SO<sub>2</sub>). **SO<sub>2</sub> is heavier than air, so those living near industrial sources are more at risk.** Contra Costa County has a population of 1,000,000, about 14.5% of the Bay Area, but emits 34% of the region's SO<sub>2</sub>. The difference between 14.5% and 34% is largely due to the refineries, which pump over 14 tons PER DAY of SO<sub>2</sub> into the air, mostly by 'flaring' which causes local high level spikes of SO<sub>2</sub>, "pollution hot spots that threaten people's health in fence line communities."<sup>xvii</sup>

### HEALTH EFFECTS OF SULFUR DIOXIDE (SO<sub>2</sub>)<sup>xviii</sup>

In the air, SO<sub>2</sub> can convert to **sulfuric acid**. It is severely irritating to the eyes, mucous membranes, skin, and respiratory tract. Short-term exposures to high levels are life-threatening. Long-term exposure also affects health. Long-term studies link SO<sub>2</sub> pollution and respiratory symptoms.<sup>xix</sup> Exercising asthmatics are affected. **Asthma occurs more often in African Americans, children between the ages of 8 and 11, and people in cities.** Asthma death rates are higher in non-Caucasians, and therefore, it is expected that asthmatic African Americans, especially children living in urban areas, suffer increased adverse affects from SO<sub>2</sub>. In workers, inhaled SO<sub>2</sub> may

make the bronchial tubes more sensitive to many other irritants<sup>xx</sup>.

ZIP CODE 94801 — 2008 TOXICS RELEASE INVENTORY (TRI)<sup>xxi</sup>

The 2008 TRI for zip code 94801—the Richmond zip code most affected by this proposal— shows that 810,305 pounds of 37 different toxic substances were released: 132,213 pounds to landfill, and **678,092 pounds directly into the environment** via fugitive air emissions, point source air emissions, and surface water discharges.

THE SANTA FE WATERSHED IS PRIORITIZED FOR PCB & MERCURY CLEANUP<sup>xxii</sup>

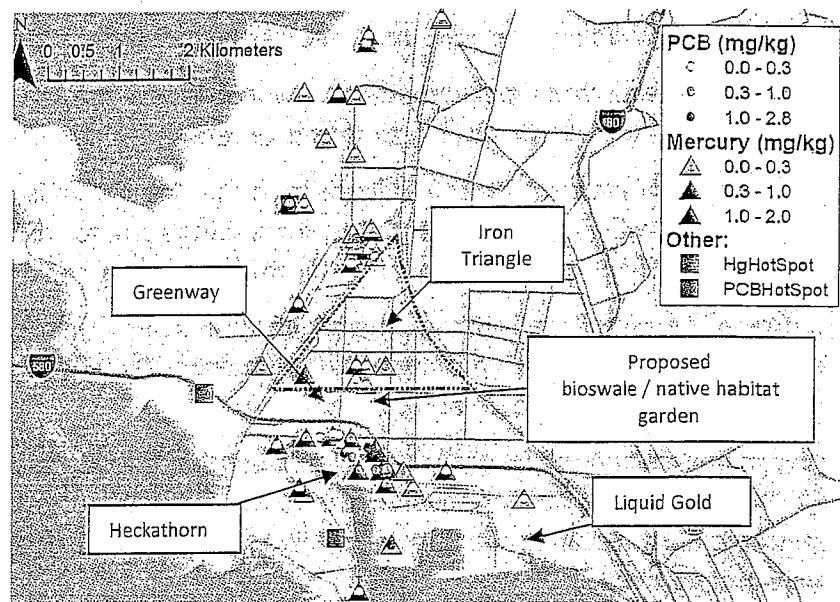
The project is located in the Santa Fe Channel Watershed. Soil samples in the watershed indicate elevated mercury levels in stormwater sediments (1.12 - 1.99 mg/kg), and elevated PCB levels (1.39 - 2.79 mg/kg)<sup>xxiii</sup>

RICHMOND SUPERFUND SITES<sup>xxiv</sup>

**Richmond has two superfund sites, United Heckathorn and Liquid Gold Corporation.**

**Heckathorn** is .5 mile from the Greenway.

Over 10% of the city's population lives within a mile of the site. The site's bay water sediments are contaminated with DDT and Dieldrin. A 2008 fish analysis of health risks there found a threat to wildlife and humans. So, the state issued an advisory (still active) against eating fish from the Richmond Harbor area. **The Liquid Gold Oil site** is 2 miles from the Greenway. The population within 4 miles is ~ 92,000 people. Soils and groundwater are contaminated with metals and petroleum hydrocarbons. Elevated concentrations of lead, copper, and mercury and Polynuclear Aromatic Hydrocarbons (PAHs) were found.



*The project offers greater access to green spaces*

The Greenway is, for the most part, not yet green! YET! The Iron Triangle has very little green open space. Developing and greening the Greenway is a major goal of this project.

EXTENT OF PUBLIC ACCESS

The project is un-gated, and accessible at 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> Streets. The Greenway connects to the Bay Trail, to the Ohlone Greenway, BART, and AC Transit.

*How else does the project contribute to fairness and equity in the community?*

This project engages the community in liberating itself from the environmental injustices of the Iron Triangle. After the project, the community will have more open space, more recreational resources, more access to nature and healthy food, and be empowered to further green the Greenway.

PROJECT READINESS

Demonstrate an ability to complete the project within the timelines imposed by the appropriation.

STEPS TO BE TAKEN IMMEDIATELY FOLLOWING THE GRANT AWARD

After the grant is awarded the Project Manager will finalize the construction schedules and begin implementation. Most of the construction will have to take place in December so the planting can be done soon after the rainy season begins. The project plans will be ready for the construction phase, so as soon as the

funding is available the project will be implemented. The construction of the bioswale and habitat gardens will be done in two phases. Phase 1 will take place as soon as the funds are available and phase 2 will be done in late spring after the rains subside. Planting will take place during the rainy season of 2010 and 2011 to limit the need for extensive irrigation. The community and student volunteers will be scheduled and get involved after heavy hardscaping is complete.

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#### PERFORMANCE MEASURE STANDARDS

The Project's success will be evaluated based on the following performance measures:

Number of trees and other plants planted that survive the first year (75%): TWP has complete protocols to monitor plant survivability and will survey the site twice a year to evaluate plant survival.

Functioning bioswale that precludes standing water on site (max of 24 hours) and reduces water turbidity by 50% during moderate rain fall events (5 year storms or less).

Water quality improvements to the effluent from the site: TWP has done water quality testing of the site pre-construction and will perform the same test for turbidity due to soil erosion, presence of heavy metals, oils and other urban runoff pollutants of concern after the project has been implemented.

Reduction in the use of pesticides and herbicides due to IPM synergies with habitat garden: TWP works with other gardeners in the Greenway to promote IPM techniques. We will track number of people that learned about IPM during our events and public meetings.

Number of people and students that learned about the function and application of a bioswale to reduce urban runoff: TWP tracks the number of volunteer hours donated for the implementation of the project and the number of volunteers and students that participated in a service learning/community service project at the Greenway bioswale and garden.

Increased number of people that visited the Greenway between 6<sup>th</sup> and 8<sup>th</sup> street during organized events: TWP tracks volunteers and residents that participate during fairs, festival and public workdays. Will also conduct surveys to neighbors to evaluate their understanding and impression of the project.

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#### PROVIDE THE STATUS OF THE FOLLOWING, AS APPLICABLE

**Preliminary design plans including plant palettes.** Restoration Design Group has provided design plans and a palette for the garden aspect. We have complete funding for swale design and are in process of obtaining that now. Expected completion of the design is July 30th, 2010.

**CEQA compliance.** The City of Richmond has taken the lead agency role for CEQA purposes and has determined that the project is 'categorically exempt.'

**Permits.** NO Permits are needed for this project.

**Commitments from project partners .** TWP has signed an agreement with the City of Richmond as part of its "Adopt-a-Trail/Park" program for access to the site for this multi-year project. Their support is indicated in the attached Letter of Support which detail the City's commitment to provide swale materials, heavy equipment, operators, and advice on stormwater best management practice. East Bay Municipal Utilities District is providing all the interpretive signage pro bono. Also indicated in our Letters of Support are commitments from community groups to collaborate in keeping the community engaged in the project.

**For Acquisition projects ... N/A**

**What other factors may affect the project. How will these factors be addressed?**

Funding is the only remaining obstacle. We will continue to fundraise and adjust the schedule as needed.

*Sources of funding and amounts already committed to the project and expected timing of funds*

San Francisco Estuary Project	\$13,800	Awarded, funds available by reimbursement
US EPA EJ Grant Program	\$25,000	Awarded, funds available summer 2010
Clif Bar Family Foundation	\$10,000	Received
Patagonia	\$2,000	Received

**ORGANIZATIONAL CAPACITY**

*The Watershed Project's experience in completing this type of project*

Three kinds of expertise are required: Swale design and installation, native plant restoration and landscaping, and community engagement.

- **Swale Design.** Design service providers are (1) an engineer at Bayer Healthcare who supervised the design and installation of numerous swales at Bayer's Berkeley, CA facility, and (2) The consulting firm that Bayer used (Aliquot) to design their swales.
- **Native plant garden.** We have over a decade of experience doing native plant restoration. We recently revegetated a 5-acre marsh at Stege Marsh, successfully restoring Clapper Rails to the site.
- **Community engagement.** Every year, we recruit and successfully deploy over 1,000 volunteers to work on stewardship projects ranging from Coastal Cleanups to native habitat restoration. Most recently, on Earth Day 2010, 376 volunteers collected 5,690 lbs of trash from local creeks and shorelines.

*Explain how you plan to keep the community informed and involved in the project*

We will continue partnering with Friends of the Richmond Greenway and others (see our Letters of Support) to stay in touch with the community. We will do multiple outreach and workday events every year and recruit volunteers to work on the Greenway Service. Our service learning projects inform students and families about ongoing efforts.

*Long-term maintenance?*

Once the swale garden is installed the only maintenance required is weeding and trash removal. This will be accomplished using volunteers and service learning students, coordinated by TWP, and funded by on-going fundraising. TWP will be responsible for these tasks for a minimum of 10 years post-completion of the project.

*Responsibility for plantings*

The Watershed Project is assuming responsibility for ongoing weeding and plant replacement as needed.

*Protection from vandalism and deterioration*

Drip irrigation controls and other watering related tools will be kept on-site in a locked box. Drip lines will be buried under mulch. Planting procedures include re-introduction of mycorrhizae into the soil to help plants establish and thrive. Plants that are lost will be replaced.

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**CONTINGENCY PLANS TO COVER ANY EXCESS COSTS**

We will conduct on-going fundraising until the project is completed, and after that, to cover maintenance.

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<sup>i</sup> Dan Cayan, Climate, Atmospheric Sciences, and Physical Oceanography Research Division, Scripps Institution of Oceanography, UCSD. Personal communication (2010)

<sup>ii</sup> Pedestrian Safety in California; Five Years of Progress and Pitfalls, Surface Transportation Policy Project, California Walks, San Francisco, California, August 2002



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- iii Contra Costa County Welfare-to-Work Transportation Action Plan (1999)
- iv <http://www.cityofrichmondgeneralplan.org/docManager/1000000795/10%20Parks.pdf>
- v See pages 11, and 43-45 of <http://www.arb.ca.gov/cc/sb375/rtac/report/092909/finalreport.pdf>
- vi [http://www.railstotrails.org/resources/documents/whatwedo/atfa/ATFA\\_20081020.pdf](http://www.railstotrails.org/resources/documents/whatwedo/atfa/ATFA_20081020.pdf)
- vii See Volunteering and Mental Health— Literature Review.  
<http://www.energizeinc.com/art/subj/documents/volunteeringandmentalhealth.pdf>
- viii <http://mentalhealth.about.com/od/depression/a/howexercise.htm>
- ix Richard Louv in "Last Child in the Woods"
- x Based on a 1.4 meter sea level rise and a 100 year flood event. See [http://www.pacinst.org/reports/sea\\_level\\_rise/](http://www.pacinst.org/reports/sea_level_rise/)
- xi Calif. Climate Change Center. "Climate Change Scenarios & Sea Level Rise Estimates for the 2008 ... Scenarios Assessment"
- xii University of Michigan School of Natural Resources and Environment website. <http://www.umich.edu/~snre492/sherman.html>
- xiii NPR story transcript, 12/28/09: <http://www.npr.org/templates/story/story.php?storyId=121974899>
- xiv pm10, pm2.5 (particulate matter, 10 & 2.5 microns, respectively), reactive organics, nitrogen, sulfur dioxide, and carbon dioxide
- xv [www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/summaryreport\\_final\\_april\\_08\\_09.ashx](http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/summaryreport_final_april_08_09.ashx)
- xvi California Air Resources Board website: <http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-reports.htm>
- xvii Communities for a Better Environment: "Refinery Flaring in the Neighborhood": <http://www.cbecal.org/pdf/refinery-neighborhood.pdf>
- xviii Center for Disease Control's Dept of Health & Human Services Agency for Toxic Substances Registry website:  
<http://www.atsdr.cdc.gov/toxprofiles/phs116.html#bookmark02>
- xix [http://healthychild.org/issues/chemical-pop/sulfur\\_dioxide/](http://healthychild.org/issues/chemical-pop/sulfur_dioxide/)
- xx <http://www.mayoclinic.com/health/occupational-asthma/DS00591/DSECTION=causes>
- xxi Information in this section from the US EPA Toxic Release Inventory. See <http://www.epa.gov/tri/>
- xxii Study prepared by the consulting firm Malcolm Pirnie for the City of Richmond
- xxiii Ibid
- xxiv EPA's website: <http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vWSOAlphabetic?openview>